

# Response of pharyngeal gonorrhoea to single dose penicillin treatment

M Z C SULAIMAN, C M BATES, J B BITTNER, C A DIXON, AND R C B SLACK

*From the Department of Genitourinary Medicine, General Hospital, Nottingham*

**SUMMARY** The prevalence of gonococcal infection of the pharynx in 205 women, 331 heterosexual men, and 11 homosexual men with gonorrhoea was 6·8%, 4·2% and 27·3% respectively. In only one patient, a heterosexual man, was the pharynx the sole site of infection. Throat symptoms were found in 7% of women, 21% of heterosexual men, and none of the homosexual men. Orogenital contact was reported by 29% of women, 36% of heterosexual men, and all the homosexual men. A single intramuscular dose of 1·8 g Bicillin (procaine penicillin 1·5 g plus benzyl penicillin 300 mg) cured 90% of patients.

## Introduction

Several studies have shown that gonococci are more difficult to eradicate from the pharynx than from the urethra, cervix, or rectum.<sup>1-4</sup> Whereas single dose regimens are the treatment of choice in uncomplicated anogenital infections, multiple dose treatments are widely advocated for the treatment of pharyngeal gonorrhoea.<sup>1-7</sup> This, however, requires patient compliance.

In Nottingham the standard treatment of uncomplicated gonorrhoea is a single intramuscular dose of 1·8 g Bicillin (procaine penicillin 1·5 g plus benzylpenicillin sodium 300 mg; Brocades, Weybridge, England). This prospective study was undertaken to evaluate the effectiveness of this treatment in gonococcal pharyngitis.

## Patients and methods

We studied all heterosexual patients with gonorrhoea or with documented exposure to gonorrhoea and all male homosexual patients attending the department of genitourinary medicine in Nottingham between July and December 1985. Patients receiving antimicrobial treatment were excluded. Using sterile cotton tipped swabs (Minitip Exogen) material was taken from the tonsils and posterior pharynx by a clinic doctor before treatment, and any relevant symptoms or signs pertaining to the pharynx were recorded. Specimens were transported to the laboratory in Amies medium incorporating charcoal. Patients who had gonorrhoea

diagnosed at any site, and who had no history of allergy to penicillin, were given 1·8 g Bicillin by injection into the gluteal muscle. They were requested to attend for test of cure visits seven and 14 days after treatment. At the follow up visits pharyngeal swabs were taken from patients with microbiologically proved pharyngeal gonorrhoea. They were informed of the diagnosis and asked if they had practised orogenital sex.

## BACTERIOLOGICAL INVESTIGATIONS

Material was cultured on modified New York City (MNYC) medium and selective medium as described previously.<sup>8</sup> The selective medium contained vancomycin 2·5 mg/l, colistin 1·2 mg/l and trimethoprim 5 mg/l. All plates were incubated in 7% carbon dioxide at 37°C. They were examined daily for four days. Typical oxidase positive colonies were Gram stained, and suspicious Gram negative diplococci were subcultured on MNYC medium and incubated as before. The same colonies were also plated on nutrient agar and blood agar and incubated aerobically at room temperature. Carbohydrate fermentation was performed on colonies that grew only in carbon dioxide at 37°C. Rapid sugar reactions for preformed enzyme were used.<sup>9</sup> Additional identification of *Neisseria gonorrhoeae* was by the fluorescent antibody test. Antimicrobial sensitivities were measured, as described previously,<sup>8</sup> by agar gel dilution on MNYC medium with 7% lysed horse blood using an inoculum of about 100 colony forming units.

## Results

Anogenital gonorrhoea was found in 205 of 368 women, 331 of 443 heterosexual men, and 11 of 73 homosexual men entering the study. Concomitant pharyngeal infection was found in 14 women, 14

Address for reprints: Dr M Z C Sulaiman, Department of Genitourinary Medicine, Royal Hallamshire Hospital, Glossop Road, Sheffield S10 2JF

Accepted for publication 28 June 1986.

TABLE I Summary of results

Patients	No with gonorrhoea	No (%) with pharyngeal gonorrhoea	No treated with Bicillin* only and followed up	No (%) cured
Women	205	14 (6.8)	11	10 (90.9)
Heterosexual men	331	14 (4.2)	7	6 (85.7)
Homosexual men	11	3 (27.3)	2	2 (100)

\*Single intramuscular dose of 1.8 g Bicillin (procaine penicillin 1.5 g plus benzyl penicillin sodium 300 mg).

heterosexual men, and three homosexual men. The pharynx was the only site affected in one heterosexual man. He had tonsillitis and his contact had been treated for genital gonorrhoea. Thus the prevalence of pharyngeal infection in all patients suffering from gonorrhoea was 6.8% in women, 4.2% in heterosexual men, and 27.3% in homosexual men (table I).

Of the infected patients, one (7.1%) woman, three (21.4%) heterosexual men, but no homosexual men complained of throat symptoms. Orogenital contact was reported by four (28.6%) women, five (35.7%) heterosexual men, and all three homosexual men. Investigation of the male consorts of women denying orogenital contact but found to have pharyngeal gonorrhoea did not show any with pharyngeal infection.

Eleven women, 11 heterosexual men, and two homosexual men were treated with Bicillin. Seven patients were given alternative treatment with either kanamycin (1), ceftriaxone (2), triple tetracycline (2), cefotaxime (1), or Bicillin and triple tetracycline (1) because they had a history of allergy to penicillin (3), coexisting chlamydial cervicitis (1), infection with a strain of *N gonorrhoeae* with reduced sensitivity to penicillin (1), or what was initially thought to be non-gonococcal urethritis (1) or non-gonococcal proctitis (1).

Of the patients receiving Bicillin only, 11 women, seven heterosexual men, and two homosexual men returned for evaluation after treatment. Eighteen (90%) had culture negative pharyngeal swabs (table I). The two treatment failures (one woman and one heterosexual man) were infected with non-penicillinase-producing strains of *N gonorrhoeae* with reduced sensitivities to penicillin (MICs of 0.1 and 0.2 mg/l penicillin). They were subsequently cured with cefotaxime 1 g and ceftriaxone 250 mg respectively. The MICs of penicillin for the pharyngeal isolates of *N gonorrhoeae* varied between 0.02 and 0.5 mg/l; no isolate produced  $\beta$  lactamase.

## Discussion

The prevalence of pharyngeal infection was 6.8% in women, 4.2% in heterosexual men, and 27.3% in homosexual men with gonorrhoea. The prevalence in

women was lower than that quoted by other workers (table II). In our study, however, only a single pharyngeal culture was taken before treatment, and it is accepted that the sensitivity of a single pharyngeal culture is low. Another reason for the geographical variation in prevalence must be differing sexual practices in the populations studied. The prevalences in heterosexual men and in homosexual men were similar to those found in previous studies.<sup>13 15</sup> The greater prevalence of pharyngeal gonorrhoea in women and homosexual men compared with heterosexual men is not surprising because of the practice of fellatio.

Of the 31 patients with pharyngeal gonorrhoea, only four had symptoms, and only nine out of the 28 women and heterosexual men reported having engaged in orogenital contact. This suggests that signs and symptoms of a throat infection or a history of oral sex are unreliable as criteria for testing the pharynx.

Eighteen of the 20 patients who attended follow up were culture negative after treatment, giving a cure rate of 90%. This compares favourably with cure rates achieved with intramuscular aqueous procaine penicillin G 2.4 to 4.8 MIU with or without probenecid (86% to 100%),<sup>1 12 16 17</sup> oral tetracycline 2 g daily for five days (100%),<sup>1 16 17</sup> oral trimethoprim/sulphamethoxazole 720 mg/3600 mg a day for five

TABLE II Prevalence of pharyngeal gonorrhoea in patients with gonorrhoea reported from various countries

Patients	Location	No with gonorrhoea	No (%) with pharyngeal gonorrhoea
Women	Norway <sup>10</sup>	450	51 (11.3)
	Denmark <sup>3</sup>	542	55 (10.1)
	USA <sup>1</sup>	310	32 (10.3)
	Netherlands <sup>11</sup>	130	11 (8.5)
	England <sup>12</sup>	239	24 (10.0)
	USA <sup>13</sup>	172	23 (13.4)
	USA <sup>14</sup>	121	22 (18.2)
Heterosexual men	Denmark <sup>3</sup>	765	37 (4.8)
	USA <sup>1</sup>	95	3 (3.2)
Homosexual men	Denmark <sup>3</sup>	48	12 (25.0)
	USA <sup>1</sup>	67	14 (20.9)
	England <sup>13</sup>	41	6 (14.6)

days (100%),<sup>6</sup> and intramuscular ceftriaxone 125 mg (88% to 100%).<sup>18</sup> In most of the studies in which a "100% cure rate" was achieved, only a single test of cure culture specimen was taken from the pharynx, whereas at least two pharyngeal specimens should be taken after treatment to confirm the result. In addition, Bicillin, which is given as a single 5 ml injection, was well tolerated by our clinic population.

Routine screening for gonococcal colonisation of the pharynx in patients attending genitourinary medicine clinics would not be cost effective. The findings in this study, however, show that pharyngeal cultures should be performed not only in women and homosexual men at risk of contracting gonorrhoea, but also in heterosexual men who have been exposed to infection. Single dose treatment with Bicillin is effective unless the organism is relatively resistant to penicillin.

We thank the clinical assistants and the nursing and reception staff of the Perth and Amberley House clinics, and the medical laboratory scientific officers in the Public Health Laboratory, Nottingham, who co-operated with this study, Mrs S Brailsford and Mrs C Gibson for secretarial help, and Dr G R Kinghorn for his helpful comments.

## References

1. Wiesner PJ, Tronca E, Bonin P, Pederson AHB, Holmes KK. Clinical spectrum of pharyngeal gonococcal infection. *N Engl J Med* 1973;288:181-5.
2. Handsfield HH. Disseminated gonococcal infection. *Clin Obstet Gynecol* 1975;18:131-42.
3. Bro-Jorgensen A, Jensen T. Gonococcal pharyngeal infections. *British Journal of Venereal Diseases* 1973;49:491-9.
4. Kraus SK. Incidence and therapy of gonococcal pharyngitis. *Sex Transm Dis* 1979;6 suppl:143-7.
5. Washington AE. Update of treatment recommendations for gonococcal infections. *Rev Infect Dis* 1982;4 suppl:5758-71.
6. Tice AW, Rodriguez VL. Pharyngeal gonorrhoea. *JAMA* 1981;246:2717-9.
7. Anonymous. The 1985 sexually transmitted disease treatment guidelines. *MMWR* 1985;34 suppl:81-3.
8. Dixon CA, Bittiner JB, Shahidullah M, Slack RCB, Sulaiman MZC. Randomised observer blind comparative trial of ceftriaxone and penicillin in the treatment of uncomplicated gonorrhoea in men and women. *Genitourin Med* 1986;62:78-81.
9. Young H. Cultural diagnosis of gonorrhoea with modified New York City (MNYC) medium. *British Journal of Venereal Diseases* 1978;54:36-40.
10. Odegaard K, Gundersen T. Gonococcal pharyngeal infection. *British Journal of Venereal Diseases* 1973;49:350-2.
11. Stolz E, Schuller J. Gonococcal oro- and nasopharyngeal infection. *British Journal of Venereal Diseases* 1974;50:104-8.
12. Kinghorn GR, Rashid S. Prevalence of rectal and pharyngeal infection in women with gonorrhoea in Sheffield. *British Journal of Venereal Diseases* 1979;55:408-10.
13. Osborne NG, Grubin L. Colonisation of the pharynx with *Neisseria gonorrhoeae*. *Sex Transm Dis* 1979;6:253-6.
14. Fiumara NJ. Treatment of women with uncomplicated gonococcal infection. *Sex Transm Dis* 1980;7:85-6.
15. Shahidullah M. Pharyngeal gonorrhoea in homosexuals. *British Journal of Venereal Diseases* 1976;52:168-9.
16. Fiumara NJ. Pharyngeal infection with *Neisseria gonorrhoeae*. *Sex Transm Dis* 1979;6:264-6.
17. Sands M. Treatment of gonococcal pharyngeal infections in men. *West J Med* 1979;131:338.
18. Judson FN, Ehret JM, Handsfield HH. Comparative study of ceftriaxone and spectinomycin for treatment of pharyngeal and anorectal gonorrhoea. *JAMA* 1985;253:1417-9.